

# EXERCISE PROGRESSION AFTER CONCUSSION

Each course of action will have to be adjusted to the student's individual needs.

STAGE OF REHABILITATION	GOALS	RECOMMENDED EXERCISES
<p><b>STAGE 1</b></p> <p><b>Target Heart Rate:</b> 30-40% of maximum exertion</p> <p><b>Recommendations:</b> Exercise in a quiet and safe area; no impact activities; may try very limited balance exercises if tolerated.</p> <p>10-15 minutes of light cardio exercise trials. Multiple trials can be done if symptoms are not worsened.</p>	<p><b>Prevent deconditioning (prevent "sluggish, couch potato effect" from too much rest)</b></p> <ul style="list-style-type: none"> <li>Stretch and walk at least twice per day</li> <li>No running, no contact; exercise with movement in neutral planes (avoid fast head movements or bending over)</li> </ul> <p><b>Level of exercise:</b> you can still breathe through your nose comfortably</p>	<p>Walking, stretching, slow bodyweight squats (10-15 minute trials)</p> <p>Upper extremity (UE) very light hand weights; resistive band rowing; lower extremity (LE) straight leg raises</p> <p>Gentle neck range of motion; shoulder, pectoralis, hamstring, hip flexor, quadriceps, calf stretching ("top to bottom stretching" of all large muscle groups)</p> <p><b>Proceed to Stage 2</b> when you can attend full days at school (with academic adjustments if necessary) and symptoms are minimal</p>
<p><b>STAGE 2</b></p> <p><b>Target Heart Rate:</b> 40-60% of maximum exertion</p> <p><b>Recommendations:</b> May use various exercise equipment. Some mild positional changes and head movement introduced</p> <p>10-15 minutes of cardio exercise trials.</p>	<p><b>Light to moderate aerobic conditioning, resistance training, stretching and balance</b></p> <ul style="list-style-type: none"> <li>Moderate balance activities; perform with minimal head position changes</li> <li>Light/moderate work with resistance bands and light dumbbells</li> </ul> <p>Level of exercise: you have to breathe through your mouth but can talk without pausing to catch your breath</p>	<p>Stationary bike; light swimming; resistive band exercises (UE/LE); wall squats; lunges; step-up/down</p> <p>Any Stage 1 stretching, active stretching as tolerated (lunge walks; side-to-side groin stretch; walking hamstring stretch)</p> <p>If muscular neck pain persists, continue to treat with massage, shoulder exercises, and gentle stretch</p> <p><b>Proceed to Stage 3</b> when school is tolerated and you are symptom free</p>
<p><b>STAGE 3</b></p> <p><b>Target Heart Rate:</b> 60-80% of maximum exertion</p> <p><b>Recommendations:</b> Any environment ok for exercise (indoor/outdoor); integrate strength, conditioning &amp; balance exercises; can incorporate concentration challenges (counting exercises, visual games)</p> <p>Moderately aggressive aerobic and strength exercises. 20-30 minutes of cardio and strength training exercise trials.</p>	<p><b>Running, jumping, plyometrics (no contact)</b></p> <ul style="list-style-type: none"> <li>Exercise with head movements in all planes, including quickly bending forward if tolerated</li> <li>Challenging balance exercises, challenging positional changes</li> </ul> <p><b>Level of exercise:</b> you have to breathe through your mouth and catching your breath impedes ability to talk continuously (exercise is not at the level of maximal exercise intensity)</p>	<p>Treadmill (jogging); stationary or outside bike; elliptical; resistive weight training including free weights; dynamic strength activities</p> <p>Half speed agility drills (zig-zag runs, side shuffle, ball toss, balance disc; squats &amp; lunges on BOSU ball); OK for noncontact ice skating, stick handling, light ball kicking, batting cage</p> <p><b>Proceed to Stage 4</b> after several days of Stage 3 success and when academic adjustments are not needed (full academic success)</p>
<p><b>STAGE 4</b></p> <p><b>Target Heart Rate:</b> 80% of maximum exertion</p> <p><b>Recommendations:</b> Continue to avoid contact activity, but resume aggressive training in all environments if symptoms are gone.</p>	<p><b>Full intensity NON-CONTACT physical training</b></p> <ul style="list-style-type: none"> <li>Sport-specific activities and drills</li> <li>Full aerobic and strength exercises</li> </ul> <p>Level of exercise: At the level of maximal intensity</p>	<p>Graded treadmill; sprint conditioning and interval training; sport-specific drills/training</p> <p>35- to 45-minute trials</p> <p><b>Proceed to Stage 5 (contact activities) ONLY after evaluation and full clearance by your treating clinician</b></p>
<p><b>STAGE 5</b></p> <p><b>Target Heart Rate:</b> Full exertion</p> <p><b>Recommendations:</b> Initiate contact activities as appropriate to sport activity, full exertion for return to competition.</p> <p><b>DO NOT PROCEED TO CONTACT ACTIVITIES UNTIL CLEARANCE</b></p>	<p><b>Continue aggressive strength/conditioning exercises</b></p> <ul style="list-style-type: none"> <li>Sport-specific activities and drills</li> <li>Consider isometric neck/periscapular strengthening and proprioception training to prevent future injuries</li> <li><b>Full contact activities only if symptoms do not return</b></li> </ul>	<p>Programs typically led by team athletic trainers or coaches</p> <p>Practice &amp; game intensity training</p> <p>Typically, at least two practices are completed before game play</p> <p>Immediately report any return of symptoms</p>

\*Max HR is (220-your age); Target Heart Rates calculated by Karvonen's equation: ((Max HR – Resting HR) X Target Percentage) + Resting HR